In Arizona's higher education environment, Arizona State University through their world-class Computer Commons and statewide outreach through ASPIN, has exhibited vision and persistence in bringing access to advanced information resources to the educational community and beyond. Northern Arizona University's NAUNet has pioneered distance learning, again statewide, with an extensive microwave network and a commitment to content development (again see the section on Arizona Projects and Activities of Note for more details). The Western Governor's Association has articulated a vision of a degree-granting "Virtual University" through their SmartStates program, foreseeing regional cooperation in distance learning for cost-effective, high quality delivery of higher and adult education. From the land-grant universities of the 19th century, America has committed its resources to the development and support of its higher educational institutions. In the past, this often meant the funding of physical infrastructure, institutions that students came to. In the Information Age, this support will hopefully translate to deployment of high technology infrastructure and applications, enabling the institution's offerings to be participated in "virtually" or remotely.

Electronic Democracy and Access to Government Information:

With one simple click of the mouse, one is granted rights of citizenship into a virtual community of individuals that spans the globe. As the Internet, including the World Wide Web and the various online services available today, has grown, so, too, has the ability of the individual to participate in discussions on issues of regional, national, and even global importance without the usual constraints which have traditionally limited meaningful discourse among groups of individuals (cost, distance, ease of communication, geographical barriers, etc.). We cannot fully appreciate at this moment the impact this revolutionary way of communicating ideas will continue to have on reasserting the true creative and expressive potential of the individual in our democracy. The freedom of individuals, without regard for class, nationality, or ideology, to express their viewpoints, is an essential part of the Internet and the online community. Such freedom stands in sharp contrast to the "group-think" of recent decades that was perpetuated by those who still believe in a top-down "Washington knows best" attitude. The ability to engage in an electronic forum on flat taxes, welfare reform, term limits, or virtually any other issue of importance to an individual or group of individuals is helping to overcome the once wide gap between Washington and the American people.
Newt Gingrich, Speaker, U.S. House of Representatives in Boardwatch, December, 1995

The foundations of effective democracy are built on an informed citizenry, empowered to express their views and offered the opportunity to interact with and perhaps influence the policies of their government. The Federal and state governments act as enormous repositories of information that they collect and generate. Tradition and law mandate the availability of this wealth of data and electronic access is coming to offer the most versatile, logical and cost-effective means of delivery. The Federal government has undertaken with visionary zeal the development of a National Information Infrastructure and initiated efforts at all levels of government to reengineer itself and provide citizen services via advanced information access programs. A wide range of coordinated efforts and already successful programs are underway as detailed in Appendix B - Telecommunications Policy Resources.

The web transformed the Internet from an often difficult and confusing search for information to an entertaining and rewarding journey through a wealth of material in what amounts to a global electronic library. And it brought the government - both federal, state and local - into its embrace. It's hard to find a federal office, state capital, or even a city that isn't represented on the Internet. Government may fall short in many areas, but in cyberspace it has delivered with a comprehensiveness and enthusiasm that wins applause across the country. That information would cost a lot of money if you tried to get it from other sources, so there's a lot of value out there.
James Evans in Government Technology, November, 1995

Many states have undertaken similar initiatives to develop an Internet presence and deliver a broad range of information and services through this new medium. Almost all the states have home pages as an entry point for citizen access. An estimated 36 states have Legislative home pages and about 20 offer legislative tracking, if not the full text of laws and bills. (Source: Government Technology, December, 1995)

Arizona state government has provided an official home page for some time. A number of state departments have their basic mission and contact information available and depth of content continue to slowly develop. The Arizona Departments of Commerce and Education have the most advanced scope of services on the World Wide Web at this point, but the Arizona Corporation Commission's STARPAS dial-in service is most indicative of the depth of public record access that should soon develop.

> If you think of what government does, it is often the collection of information, the recording of official information, and the compilation of statistics. Yet much of what is collected and maintained by government just sort of sits there in primitive records that are sometimes accessible electronically. Yet the government is often protective of information because, certainly within the departments, there's an awful lot of turf protection in the data they collect. If government took its role as one of making information available and providing accessibility, we would see a lot more confidence by the public in government.
>
> What was clear was that for a new generation of leadership, public accessibility is part of regaining trust. In my experience as a legislator, when I went online, I immediately got a lot of e-mail from people saying it's about time, this is overdue, we've used this at work for 10 years, I'm so glad that I can contact you as a constituent. Many of them are people who probably would have never written a letter, gotten a stamp or gone through that whole process. Yet, they wanted to feel like they could be in touch and I had a wonderful experience with that.
> Earl Baker, former U.S. Senator from Pennsylvania, VP of Unisys Corporation
> in Government Technology, December, 1995

Notably, former Arizona Representative Sam Coppersmith, with the aid of ASU and ASPIN, was the first member of the U.S. Congress to go beyond e-mail to provide positions, surveys and constituent services on the Internet. The Arizona Legislature is planning an extensive World Wide Web presence for the 1996 Legislative Session. They should utilize the Governor's Office of Telecommunications Policy and the Department of Administrations Chief Information Officer to determine the range of information resources provided by other states and how they are funded, managed and delivered. And with this information, determine how best to provide encouragement or mandate that the divisions of Arizona state government move forward in the electronic provision and citizen access to public information and records.

> A popular government, without popular information or the means of acquiring it, is but a Prologue to a Farce or a Tragedy or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own Governors, must arm themselves with the power knowledge gives.
> James Madison, 4th President of the United States, 1822

Virtual Communities in Cyberspace:

The original intent behind the development of the Internet's predecessor, ARPANET, was the linking and sharing of supercomputer resources around the nation. As researchers and scientists at Universities and centers began to communicate by e-mail, the value of such collaboration became unexpectedly and quickly of significant importance to the progress of their work. Virtual communities of interest arose and over the ensuing years many others got connected and joined in leading to tens of thousands of sites, news groups and mailing lists dedicated to their own often narrow nexus of interests, applications and goals.

"Smart connections" mark a fundamental change in the way we are able to communicate in the new digital world. In this new world, more and more people are using their personal computers to create digital content. Smart connections, which are the combination of the intelligent personal computer and the communications infrastructure, advance everything from medical practices to business transactions. They enhance the way we work, play and learn.

Technology can bring to life a virtual community of people while they are visiting a site on the World Wide Web. This is a smart connection that is right around the corner. People thousands of miles apart can seem to gather in a single room. By the end of the decade, personal computers will become the most ubiquitous consumer device in the world, surpassing the television in worldwide unit sales. PCs will stand alone as the most versatile and most cost effective way to bring people and information together.
> Andrew Grove, President and CEO of Intel, in America's Network, November 1, 1995

Information Services Haves and Have-Nots:

It is sometimes thought that there is a magic solution to building the Global Information Infrastructure (GII) - for example, that the answer is the Internet, or that it is broadband ISDN, or that it is interactive cable television, or that it is future generation wireless technologies. Personally, I do not believe that there is a magic solution of this kind that some "revolutionary technology" or "killer application" will conquer the world. It is more likely that the GII will be a "network of networks" and evolve out of existing technologies and services, just as communications has always done. Let me suggest that we also have a compass - a moral compass - that should point us toward paths that maximize values such as universal access, the right to communicate and diversity of expression. These values are fundamental not only to communications, but to the democratic evolution of mankind.
> Pekka Tarjanne, Secretary General of the International Telecommunications Union (ITU)

As we move from the traditional measurement of Universal Service by telephone penetration rates to attempts to quantify Universal Access, the variety of possible services and content and the wide range of delivery mechanisms hinder any easy definition. Early analysis of technology availability (computers and modems) against demographics, such as the recent National Telecommunications and Information Administration's "Falling Through the Net: A Survey of "Have Nots" in Rural and Urban America," indicate many of the same populations are underserved. Information "have nots" are disproportionately found in rural areas and the inner cities. Not surprisingly, they also closely track the distributions of telephone penetration for race, age, region, income, and level of education.

It is not likely that as formal and encompassing a program as supported Universal Service will arise to meet the needs of the "have nots" in the Information Age. But it is necessary that the same traditional populations are targeted by a majority of the many efforts and programs that are put in place. In the absence of a national definition and plan, though not without vision and support, states and localities must take the initiative to identify and participate in broader regional and national initiatives, and where those are lacking or not appropriate or adequate for their populations, define their own.

If systems like the Internet become critical parts of national and global infrastructure, then universal access to them will be vital. Public policies that encourage universal availability of access would be a logical and desirable outcome. I hope and believe that it will be possible to provide universal access through competitive cost reduction and where appropriate, business incentives. Alternatives that apply regulatory methods to achieve this goal are often found to be inimical to good business practice and therefore, artificial and risky at best.
> Vint Cerf, VP of Data Architecture at MCI Communications Corp. and Internet pioneer

Enabling Access for Persons with Disabilities:

Technology has always proved a great enabler, a way to multiply strength or speed tasks or perform the otherwise impractical. It has similarly reenabled those with disabilities, often returning to them the mobility and capability to achieve greater independence in their personal, social, recreational, educational, and vocational activities. The amazing advances in assistive technology continue to arrive at a rapid pace, returning a semblance of lost senses or skills to the disabled. Technology transfer from advanced space, military and communications programs feed an industry supported by dedicated research institutions.

The other side of the issue is that the common telecommunications functions widely deployed in society should remain accessible. This has driven the Telephone Relay Services inclusion in Universal Service, the requirements for hearing aid compatibility of telephones, the wide availability of closed-captioning for television, the accessibility of Braille and audio books, among others. With the graphical nature of the modern computer and information access systems, care must be taken in the development of standards and the specific design of products and services to include as much as possible those with disabilities. By enabling optional input and output devices and formats, delivery of information services can continue to reach the broadest possible population. Speech output can be substituted for the graphic display while voice recognition or alternative input devices other than keyboards and mice can allow navigation and data entry. Standards and requirements for such capability will be driven at the national and international level, but it falls largely to the states and localities to provide programs and social support structures to propagate the equipment and support services necessary.

Electronic Commerce and Security:

Electronic Data Interchange (EDI) is the means by which businesses can conduct paperless, instantaneous, secure transactions. It greatly reduces transactional costs and is increasingly required by government entities and large businesses for those vendors wishing to deal with them. As harmonized international EDI business documents mature, ever more of our trade and monetary flows will pass this way. Though much EDI moves through clearing houses and third parties, it will increasingly shift to the level of direct transactions between parties on secure public networks.

Indeed, security is quickly reaching practical levels and will soon be embedded in operating systems and applications as a ubiquitous function to authenticate those in a transaction, authorize purchases and payments, secure the privacy of the matter and enter into legally binding arrangements. Much consumer electronic commerce is already taking place on the Internet via unsecured credit card purchase or to a small extent, with one of the early forms of digital cash. Some consideration for state and localities, are the issue of sales tax obligations in cyberspace, the tracking of interstate and international cash flows and the enabling and encouragement of such electronic commerce (i.e., California and Utah have enacted digital signature legislation).

> Sending a credit card number to an electronic merchant over the Internet is probably the safest way to make such a transaction. In the last week, for example, I handed my credit card to a waiter who disappeared with it for five minutes. I faxed my credit card information to a business in New Jersey, and the fax probably lay exposed to everyone in that office for hours and perhaps to the cleaning crew that night. I called a hotel and gave my credit card data to a reservation clerk and continued my recklessness by ordering some merchandise from a clothing catalog, again by reading my credit card information to some unseen operator. Compared with the risk of handing my credit card to a stranger, which I do nearly every day, sending it over the Internet is pretty secure.
> Peter H. Lewis, journalist in the New York Times (November 13, 1995)

Privacy, Censorship, Copyright and Civil Liberties:

> Everybody's watching me. You know all those articles about "Will They Spend?" Well, I'm one of **them**. Just as people are sick of polls in the weeks before elections, and predictions about who will be in the Super Bowl before the play-offs begin, I am sick of the blow-by-blow reports on retail sales figures during the so-called Holiday Season. Suddenly you feel as if you are letting your country down if you are not spending. One Jingle Bear too few and you're the consumer equivalent of a Pledge of Allegiance refusenik.
> Alice Kahn in <u>Luncheon at the Café Ridiculous</u>, 1990

In this time of enormous transitions, the whole basis of our rights and civil liberties must be reevaluated in light of emerging information and telecommunications technologies and the societal shifts they drive. The issues are plentiful, complex and often interrelated.

On the issue of citizens' privacy, one must consider the ability to accumulate and coalesce a digital picture of an individual's spending and habits and apply that to marketing or investigation. In Europe and many other countries, the secondary use of much marketing information openly brokered here, is controlled or prohibited. The availability of strong cryptography has been particularly contentious of late as the Federal government has proposed requirements enabling authorized surveillance and retaining strict export controls, which has been met by unprecedented industry and public resistance and activism. The privacy of e-mail at work or in public transit, the possibilities of anonymous messaging, the personal and intense nature of "flaming" in electronic discourse, all are elements of a broad and difficult debate.

The many new forms of publishing, both new media itself and the forms of transmittal are forcing reexamination of our intellectual property laws, especially in the area of copyright. The ability to readily copy the works of others grew with the advent of the photostat machine and with the digitization of word, image, and content in general, the potentials for digital copying and transmittal enormously complicate the rights of ownership, reproduction, royalties and fair use. Significant efforts to redefine copyright laws and adapt them to new media are underway as authors, publishers, libraries, and users meet in concert with policy makers, but expect some bumps in the road.

> As a desktop publishing medium, the World Wide Web harkens to the old model of pamphleteering, where anyone has the right to advertise opinion without censorship or editorial interference. How far can we go down this aesthetically and sociologically independent path before regulators and other forces converge to tame it, imposing a layer of moderation or editorial control between author and audience.
> Glorianna Davenport, MIT Media Lab in IEEE Multimedia Fall, 1995

Where do we set the limits of free speech in this new world of communication possibilities? Are the telecommunications providers a common carrier with no responsibility for the messages they transmit, are they publishers with the liability for content that ensues, or are they somewhere in between? Do images or content transmitted between individuals over state or national borders have to meet the "community standards" of both the sending and receiving sites to not be assailed as pornography? Fortunately, their are now voluntary industry efforts underway for "content labeling" and tools for filtering or blocking access to specific sites or types of materials. Parents and schools must assume some substantial responsibility for the protection of minors and methods to limit and monitor access will become increasingly prevalent.

Some of the most interesting and contentious issues on the new frontier concern these issues. It is well beyond the scope of this report to survey this broad landscape and even suggest solutions. However, in the Resource Guides (Appendixes B and C) are details and contact information on many public policy players active in this debate for your further investigation and consideration.

Arizona Projects and Activities of Note:

(Note: Contact information can be found in Appendix B - Telecommunication Policy Resources)

Arizona State and Municipal Government:

Arizona Corporation Commission (ACC)

State of AZ Public Access System (STARPAS) provides dial-in access via computer modem to information on corporations, limited liability companies, trademarks, tradenames, and limited partnerships having a business presence in Arizona. It is a fee based system requiring a modest $36. startup fee and a deposit account with the ACC to cover the $.50 per minute usage fee. It is a good model of providing state public records to the business and legal communities, but the deposit account model precludes casual or occasional public usage.

Arizona Department of Education (ADE)

AzEdLink is the department's current Internet access service for the K-12 educational community. For an annual fee of $35, public school instructional, administrative and support staff members as well as affiliated community members and students (currently a total of 3,000 users) dial-in via computer modem for full Internet access. The 800 service used in the pilot program has been discontinued due to traffic and cost, but in addition to Phoenix local lines, Yuma, Tucson and Flagstaff have local access. ADE (along with the Department of Commerce) has the most thoughtfully designed and useful World Wide Web site in Arizona government with their visions and goals readily accessible as well as pointers to K-12 schools hosting their own Web presence and links to many educationally related resources.

Governor's Office of Telecommunications Policy

The Governor's Commission for the Study of the Telecommunications and Information Industry in Arizona in their January, 1995 report had as their first recommendation that the state "develop visible and effective leadership for telecommunications" by establishing the Governor's Office of Telecommunications Policy to "proactively advocate, coordinate, mediate and educate Arizona residents and policy makers on telecommunications issues." Last session, the legislature enacted Senate Bill 1258 creating the office which has been in operation since July.

Arizona State Legislature

The State Legislature has promised a World Wide Web presence for the 1996 Legislative Session. The Arizona Legislative Information System (ALIS Online) will carry a full range of legislative information:
> Members' biographies, committee assignment, and sponsored legislation
> Committee background, membership, agendas, and assigned bills
> Status and full text of bills as well as the floor calendars
> Full text of Arizona Revised Statutes (ARS)

City of Phoenix

PhoenixNet is an initiative to provide broad electronic service and information to citizens, specifically targeting elderly, disabled, and economically disadvantaged citizens. Senior centers, community centers, libraries and non-profit special needs centers dispersed throughout the city are being equipped with workstations for public access to city information and services, some including assistive technology for the disabled. Aided by grants from the Telecommunications & Information Infrastructure Assistance Program (TIIAP) of the National Telecommunications and Information Administration (NTIA), Phoenix has a well thought out and organized plan to develop online information resources and going beyond general public access, to insure including targeted under-served populations.

City of Tucson

The Community And City of Tucson Information NETwork (CACTI-NET, formerly METCOM) has served the Pima County community for several years by providing electronically accessible government, local business and community information about the southern Arizona region. Their offerings include a significant body of trade, business and economic resources. In addition to their local dial-in access and gopher presence on the Internet, they serve as Tucson's gateway to the AzTeC Free-Net (see below) and are developing their World Wide Web presence for introduction in 1996.

Arizona Higher Education and Public Institutions:

Arizona State University (ASU)

Arizona State Public Information Network (ASPIN), based at ASU, assists Arizona's public organizations and communities in connecting to the Internet. Phase I connected the three primary urban areas of Flagstaff, Phoenix, and Tucson with a state-wide backbone and within these urban areas they have provided connections to many organizations (over 50 in Phoenix). Phase II, aided by NSF funding, extended the backbone out to the state's eight rural community colleges and from their into their communities. Phase III is a proposed plan to connect Arizona's K-12 schools to the backbone developing a robust educational network. ASPIN also staffs and supports three state-wide Network Information Centers (NICs) providing a one-stop ready reference point and help desk for Internet users. ASPIN will assist Navaho Community College, who just received a NTIA TIIAP grant, in establishing the Navajo Learning Network (NLN) connecting seven community college campuses and eventually all K-12 schools throughout the Navajo Nation as a single virtual campus linking educational and community resources.

Northern Arizona University (NAU)

Northern Arizona University Network (NAUNet) is an instructional interactive television (distance learning) system that NAU is building throughout Arizona encompassing over 20 independent sites with an extensive microwave network. NAUnet's classrooms are on the campuses of NAU, ten community colleges, and five rural school districts. The NAU Learning Alliance (nauLA) is a network of more than 100 satellite downlink sites across Arizona that participate in NAU satellite programs. Also joining with Missouri, Oklahoma and Washington leaders in satellite education, NAU has formed IdeaNet to connect 2,000 schools in 33 states to an interactive television and computer network, as well as provide a wide range of programming.

University of Arizona (U of A)

Arizona Health and Information Network (AZ-HIN) is a non-profit consortium of Arizona teaching hospitals and health science educational institutions based at the Arizona Health Sciences Center. AZ-HIN uses the Internet to connect hospitals, libraries, teaching and health care institutions, and to provide access to health literature databases, other information and education products. The Biomedical Communications department of the Arizona Health Sciences Center produces medical and health related teleconferences, participated in from around the state and offers classes to the three state universities via NAUNet.

Economic Development Information Centers (EDICs)

Located throughout Arizona, 28 public and community college libraries have established Economic Development Information Centers to support their local business communities and provide the information local businesses and economic development practitioners need. A core collection of business reference materials and a staff person familiar with business resources, the local economy and community are available. The EDIC staff also provide referrals to other business information specialists and support organizations, as well as performing database searching and utilizing Internet access to meet the business patron's needs. Seed money came from the federal Library Services and Construction Act while ongoing funding comes from local support and federal grants.

Arizona Associations and Industry:

Arizona Procurement Technical Assistance Network (APTAN)
APTAN is a non-profit economic development corporation that assists participating businesses in identifying and competing for federal, state, county, and local government contracts. Their computer system matches company capabilities, products and services to procurements from federal, state, county and municipal agencies, state universities and other public institutions, automatically notifying businesses of opportunities matching their stored profile. Further assistance is provided in preparation of bid packages and access to technical support information. Their Arizona Automated Vendor Inquiry System (AAVIS) allows nationwide targeted access to business profiles on over 6,300 Arizona companies.

Arizona Technology Access Program (AzTAP)
The Institute for Human Development at Northern Arizona University is the lead agency for the AzTAP program. Their mission is to increase access to assistive technology (AT) devices and services for individuals and their families. AT devices are increasingly high tech enabling access to computers and networks or through devices embedding high technology, returning function and capability to the disabled. AzTAP provides an 800 hotline for information and referral, recycling of used or abandoned assistive technology equipment, access to AbleData (an extensive database of assistive technology products), and also offers training, research and advocacy

Arizona Technology Development Authority (ATDA)
ATDA was created by the Legislature in 1993 to help Arizona firms secure federal high technology development grants. However, the last two legislative sessions have not provided the requisite funding. Last year, House Bill 2131 would have provided up to $6 million over two years as potential matching funds. Without such funds from state government, regional industry consortiums or other public-private sources, federal grants are not likely to be awarded. Twenty nine other states do have a similar authority that can provide a competitive advantage in attracting and retaining high technology firms.

Arizona Telecommunications and Information Council (ATIC)
ATIC is an economic development foundation under the Governor's Strategic Partnership for Economic Development (GSPED). Their mission is to drive implementation of an information applications and telecommunications infrastructure that will support economic growth in Arizona. ATIC provides a forum for telecommunications issues, education and advocacy involving a diverse range of public and private partners including large and small business users of telecommunication services, economic development organizations, libraries, consumer organizations, local and state government agencies, educational institutions, health care, the Arizona Corporation Commission, the Arizona Legislature, and information technology and telecommunication companies.

Arizona Telecommunication Community Computing (AzTeC)
AzTeC is an Free-Net developed to provide noncommercial access to the Internet. AzTeC serves up a variety of local information (including municipal background, news and events) and provides e-mail accounts and limited Internet access for approximately 12,000 Phoenix area residents (currently only local dial-in phone lines are provided). They are linked to many other nationwide and worldwide community-based Free-Nets and are working to site public access terminals in convenient locations throughout the community (10 in place so far).

Arizona Telecommuting Advisory Council (AzTAC)
AzTAC is a statewide telecommuting advocacy and information resource center, dedicated to making telecommuting a recognized alternative to travel for a broad range of needs. They provide telecommuting resource information and assistance to organizations, as well as holding educational seminars, workshops

and conferences. In Maricopa county alone, 93,000 employees now telecommute an average of one day a week saving 600,000 miles of travel and 12 tons of pollution each weekday.

Datalink Project

Datalink has been funded by the Arizona Legislature for study and pilot trials the last two years. Its focus is the facilitation of trade within the Pacific NorthWest Economic Region (PNWER) and throughout the NAFTA (CANAMEX) trade corridor via the discovery, cataloging and routing of trade related information such as trade leads and access to databases about companies, government agencies, and industry focused associations. Consultants have developed a pilot World Wide Web site and proposed a range of models and implementation strategies. Decisions on funding, ownership and execution are pending.

Electronic Commerce Net (ECNet)

ECNet has been one of the first broadband metropolitan area networks (MAN) to be implemented and tested within the cable industry. A joint pilot project of Cox Communications, Digital Equipment Corporation and Arizona State University, EC Net has connected approximately 12 Phoenix manufacturing companies to support collaborative engineering, improve productivity, enhance product quality and reduce time to market for new products. Utilizing the existing hybrid fiber/coax cable network to achieve 10 Mbps Ethernet connectivity, this demonstration project can evolve to serve videoconferencing, concurrent CAD, multimedia warehousing, telecommuting and high-speed Internet access needs in the years to come.

Recommendations for Arizona Action - Updating the Social Contract:

The Arizona Corporation Commission (ACC) has new rules pending that will establish a formal and well structured Arizona Universal Service Fund (AUSF). Upon approval next year, Arizona will join some 16 other states with similarly well defined and established programs. The ACC's rules define "basic local exchange telephone service" in a manner consistent with other states and retain the intent to equalize for rural areas the cost and quality of basic service, the most fundamental tenet of Universal Service. Notably, these rules anticipate the competitive entry of providers in the local loop market, spreading the contributions to the fund across all providers of basic local exchange service (as an access line surcharge) and providers of intrastate toll service (as a percentage of intrastate toll revenues). The movement from "study areas" to the more precisely defined and smaller U.S. Census Blocks, combined with the availability of approved subsidies to competitive providers on a per customer basis will encourage (but not insure) competitive entry into the high-cost areas of the state.

The impact of Federal legislative and Federal Communications Commission initiatives may well drive new scope, criteria, and responsibilities down to the state Public Utility Commission (PUC) level. The pending Federal-State Joint Board will be empowered to redefine Universal Service in terms of what minimum services it should guarantee and how they are to be funded and administered. Whether advanced information services are included in a new basic service definition or whether specific rural or public institution infrastructure funding or incentives for such services will develop, remains to be seen. The state Public Utility Commissions will certainly retain significant oversight and management, but a range of possible new directions including a "voucher" system to high-cost subscribers, block grants to the states, new calculation methodologies for geographic areas and cost basis (perhaps with proxy factors), will drive near continuous adaptation for the foreseeable future. The Arizona Corporation Commission should look to organizations such as the National Association of Regulatory Utility Commissioners (NARUC) and the National Regulatory Research Institute (NRRI) for ongoing insight to the changes occurring, model regulations and programs, as well as how state PUCs around the nation are handling the federally driven evolution of Universal Service.

Over a dozen states are "thinking out of the box" of traditional Universal Service, in that through state PUC administered rate cases or fines placed on carriers, excess earnings and penalties are being collected and applied to advanced information services development, infrastructure and deployment. These substantial pools of funds (ranging up to $500 million in Georgia) are being used to fund Internet connections for schools and libraries, distance learning applications, telemedicine and citizen access programs, as well as rural telecommunications infrastructure development. In light of the inevitable shrinking of Federal dollars to fund such initiatives, it is recommended that the Arizona Corporation Commission survey their legal structure, rules and situation to determine whether such funds could be similarly accumulated or negotiated for in Arizona and invested in these kinds of advanced information services and access. If prohibited by existing factors, the ACC and the Legislature should consider steps to enable and encourage pursuit of such telecommunications reinvestment.

Rural telephone rates and infrastructure development have been at the core of Universal Service as rural areas with their lower population densities and greater interconnection distances have always encompassed the majority of high-cost subscribers. Just as programs in rural electrification aided the development of infrastructure for electricity and telephony, rural datafication is needed today. The new realities of economic development are not based as much on land or natural resources as in the past, but rather on human resources, the skills and education of a region's workforce. As physical transportation of goods is displaced increasingly by the delivery of services, aided by the conveyance of data and information, the availability of adequate telecommunications infrastructure is becoming as important as the highways and railways of yesteryear. Promising technological advances will aid equality of service cost and capabilities, but as always, rural deployment will lag urban areas and attract fewer competitive entrants. The subsidized connection of schools, libraries and health facilities will offer a safety net for those who can't afford their own personal connections to the National Information Infrastructure. They may then get direct access at public locations or at least the benefits of their educators and health care providers having such access. Distance learning, telemedicine and videoconferencing can allow the utilization of specialists and experts on an as-needed basis from remote locations, expanding the base of knowledge and expertise available.

Even as available Federal funds shrink, many current programs will yet continue and some new ones will be initiated. For example, the USDA's Rural Business Telecommunications Partnership Loans and Rural Telemedicine Grant Program are developing and expanding while the NTIA continues its ambitious grant programs. Industry is also stepping in, particularly the high technology sector, shifting their public service contributions to educational and infrastructure projects. These amounts can be significant as with AT&T's recent announcement of $150 million for K-12 Internet connectivity and services. Regional initiatives such as the Western Governor's Association SmartStates offer collaboration and leverage by partnering with other states in the development and deployment of applications and services. It is recommended that the Governor's Office of Telecommunications Policy take the lead in identifying such public and private programs, qualifying the likelihood of Arizona participation, disseminating the pertinent information, fostering coalitions of participants and facilitating the necessary response and follow-up. Only through such coordinated and concerted effort can we expect Arizona to fully participate in these programs and funding sources.

The strength of democratic institutions and governments is founded on the rights of its constituents to be aware of its doings and remain well informed, so as to form opinions, express their viewpoints, and incorporate those perceptions and information into the fabric of their life and livelihood. Government initiatives and dissemination of a wide range of information also serves the needs of its business community and fosters economic development. Every state in the union has begun to offer its records and resources in electronic form to aid in its own operation, to better serve its citizens and to protect and foster the public interests. We recommend that the Governor's Office of Telecommunications Policy and the state's Chief Information Officer undertake to determine the range of information resources provided by states and

localities and their manner of funding, management and delivery. Further, it is hoped they will benchmark the "best practices" among states, consider where public-private partnerships may prove effective and beneficial, and recommend coordinated and progressive Arizona development in this area. The Legislature can then consider enabling and promoting future progress by mandates, incentives and coordination of funding.

In moving to make a wide-range of state government information and resources available electronically and recognizing the growing importance to modern life of accessing these and the wealth of other information assets and the ability of electronic communication to foster communities of interest, the state must also consider the means of citizen access. It is here that the long-held social compact providing Universal Service to insure access to basic telephony must evolve to a concept of Universal Access to best preclude information have-nots in the Information Age. For the citizens who live in high-cost areas or who cannot invest in the equipment and services to provide such access, the state should encourage, enable and/or provide the means of access at a community level. This may to some extent be served by the competitive telecommunications marketplace in an increasingly deregulated environment, but should also be aided by incentives or programs for the connection of schools, libraries, health institutions and the fostering of community networks.

The ideals of inclusion basic to Universal Service have always gone beyond rural access to also embody aid to the low-income and disabled segments of our population. Appropriate assistive technology must be incorporated into any and all information access initiatives to insure that every citizen may participate and benefit. Consideration should be given to e-mail as a new "basic service" enabling participation in the sending and receiving of electronic messages. Though civic networks and both public and private institutions may provide electronic mailboxes at low or no cost, the means of remote access from community level resources should be provided to best serve low-income and mobile populations.

As the National Information Infrastructure extends its reach, capabilities and importance, Arizona, with its current initiatives, high technology industry base and electronically literate citizenry, is well positioned to take advantage of the transformation from the Industrial Age to the Information Age. The premises of traditional Universal Service remain valid today, but the scope and expectation must evolve to a broader concept of Universal Access as we undergo a paradigm shift in citizen's use of telecommunications.

Electric circuitry has overthrown the regime of "time" and "space" and pours upon us instantly and continuously the concerns of all other men. We now live in a global village.

Marshall McLuhan, 1967

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Appendix A - Bibliography

Note: With the rapid pace of technological advancement in telecommunications, any bibliography provides but a brief and quickly outdated view of the state of affairs. This appendix lists some of the materials we have found useful, but we encourage you to rely more on the extensive resource guides in Appendixes B and C to keep up to date in the areas of most interest to you. Also, increasingly, some of the most topical and timely items appear in "non-traditional" forms, that is in electronic form on the Internet, never being formally published in hardcopy.

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Appendix B - Telecommunication Policy Resources

State of Arizona Resources:

Arizona State Government:

Arizona State Government Home Page   URL - http://www.state.az.us/

Arizona State Agency Index   URL - http://www.state.az.us/pages/agencyin.htm

Arizona State Legislature

(URL - http://www.azleg.state.az.us/) With the 1996 Legislative Session, the **Arizona Legislative Information System (ALIS Online)** will carry a full range of legislative information including: members' biographies, committee assignment, and sponsored legislation; committee background, membership, agendas, and assigned bills; status and full text of bills as well as the floor calendars; full text of Arizona Revised Statutes (ARS). Some unofficial legislative tracking information has been available from ASU as furnished by the Arizona Capitol Times (URL - gopher://info.asu.edu:70/11/asu-cwis/pctp/legact).

Arizona Corporation Commission (ACC) State of AZ Public Access System (STARPAS) (1300 W Washington, Phoenix, AZ 85007, (602)542-4251, fax (602)542-2129)

The ACC STARPAS provides dial-in access via computer modem to information on corporations, limited liability companies, trademarks, tradenames, and limited partnerships having a business presence in Arizona. It is a fee based system requiring a $36. startup fee and a deposit account with the ACC to cover the $.50 per minute usage fee. Access through public libraries is being considered.

Arizona Department of Commerce (DOC)

(3800 N Central Ave., Building D, Phoenix, AZ 85012, (602)280-1480, fax (602)280-1384, URL - http://www.state.az.us/ep/commhome.shtml) The DOC provides perhaps the most extensive and best developed Arizona state government Internet site to date. Some resources of interest to be found here include: **Arizona Business Assistance Center** (with its **Arizona Business Connection**), **Arizona Film Commission, International Trade and Investment, National Marketing** (business relocation support), **Office of High Technology,** and **Strategic Planning.**

Arizona Department of Economic Security (DES)

The DES **Telephone Assistance Program (TAP)** provides telephone service to households with low incomes and a medical need that requires a telephone in the home. TAP has been in existence since 1991 and currently serves about 7,000 households (in US West territory only). For further information, contact the **Community Services Administration** at (602)542-6600 or (800)582-5706.

Arizona Department of Education (ADE)

(1535 W Jefferson, Phoenix, AZ 85007-3209, (602)542-4361, URL - http://www.ade.state.az.us/) **AzEdLink** is the department's current Internet access service for the K-12 educational community. For an annual fee of $35, public school instructional, administrative and support staff members as well as affiliated community members and students (currently a total of 3,000 users) dial-in via computer modem for full Internet access. The 800 service used in the pilot program has been discontinued due to traffic and cost, but in addition to Phoenix local lines, Yuma, Tucson and Flagstaff have local access. On their World Wide Web one can view ADE's visions, goals and programs as well as pointers to K-12 schools hosting their own Web presence and links to many educationally related resources.

Arizona Department of Environmental Quality (ADEQ)

(3033 N Central Ave., Phoenix , AZ 85012, (602)207-2300, (800)234-5677) ADEQ runs a voice **Information Center** service at (602)207-2217, an **Environmental Education Program** at (602)207-4145,a **Technical Assistance Program** at (602)207-4337 and the **Environmental/Recycling Hotline** at (602)253-2687 or (800)947-3873. ADEQ is developing electronic access to their publications.

Department of Library, Archives and Public Records (DLAPR)

(State Capitol, 1700 W Washington, Phoenix, AZ 85007, (602)542-4035, (800)255-5841, fax (602)542-4972, URL - http://www.lib.az.us/) The DLAPR was formed in 1937 as part of the state Legislature, serving the information needs of Arizona government and citizens by providing access to unique historical and contemporary resources. The **Records Management Division** facilitates the handling of government public records and the **Arizona State Archives** at (602)542-4159 makes them available to the public. The **Braille and Talking Book Library (BTBL)** loans recorded books and magazines as well as the equipment on which to play them ((602)255-5578, (800)255-5578). The **Arizona Newspaper Project** at (602)542-3701 is cataloging and microfilming over 1500 Arizona newspapers published since 1859. The catalog will be developed into an Internet accessible resource in 1996.

Governor's Office of Telecommunications Policy

(1700 W Washington, Room 174, Phoenix, AZ 85007, (602)542-0142, fax (602)542-0134, e-mail - jkelly@ad.state.az.us) The Governor's Office of Telecommunications Policy was established to develop visible and effective leadership for telecommunications and to proactively advocate, coordinate, mediate and educate Arizona residents and policy makers on telecommunications issues. Last session, the legislature enacted Senate Bill 1258 creating the office, which has been in operation since July, 1995. Look for the content and resources of this report on their Internet site expected in 1996.

Arizona Non-Governmental Resources:

Arizona Broadcasters Association (ABA)

(3101 N Central Ave., Suite 550, Phoenix AZ, 85012-2639, (602)274-1418, fax (602)631-9853) The ABA is the official trade association serving all radio and television stations in Arizona with government relations support as well as acting as a clearing house of information for all FCC and National Association of Broadcasters departments. 1995 membership included 63 radio and 22 television stations.

Arizona Cable Television Association (ACTA)

(3610 N 44th St., Suite 240, Phoenix AZ, 85018, (602)955-4122, fax (602)955-4505) ACTA represents Arizona cable television companies providing publications and research as well as working with state and federal lawmakers, the Arizona Corporation Commission and municipal government to implement positive programs and resolve issues for the cable television industry.

Arizona Consumers Council

(PO Box 1288, Phoenix AZ 85001, (602)265-9625, Tucson (520)327-0241) The Arizona Consumers Council is an educational, research and advocacy consumer organization. The Council works with state and national consumer and other organizations to promote legislation to protect and give consumers a voice in marketplace decisions conducting fairs, workshops, seminars and conferences on consumer issues.

Arizona Education and Information Telecommunications Cooperative (AEITC)

(contact Dr. William Lewis, Vice Provost for Information Technology, Arizona State University, (602)965-9059, e-mail - william.lewis@asu.edu) AEITC encourages and advances cooperative planning and development of educational and informational telecommunications in the State of Arizona. Originally formed in 1988, the organization is currently being reorganized and reactivated.

Arizona Electronic Commerce/Electronic Data Interchange Roundtable

(AZ EC/EDIR) (c/o Dave Darnell, SysTrends Inc., 1850 E Carver Rd., Tempe, AZ 85284, (602)838-5316, fax (602)897-8479, e-mail - dave_d@systrens.com) AZ EC/EDIR is an informal, cross-industry Electronic Commerce and Electronic Data Interchange user group formed to promote and support the use of EC/EDI in Arizona by sharing experiences and information.

Arizona Health and Information Network (AZ-HIN)

(Arizona Health Sciences Center, University of Arizona, Tucson AZ 85724, (520)626-7343, fax (520)626-2145) Arizona Health and Information Network (AZ-HIN) is a non-profit consortium of Arizona teaching hospitals and health science educational institutions based at the **Arizona Health Sciences Center**. AZ-HIN uses the Internet to connect hospitals, libraries, teaching and health care institutions, and to provide access to health literature databases, other information and education products.

Arizona Innovation Network (AIN)

(1435 N Hayden Rd., Scottsdale, AZ 85257-3773, (602)990-9558, fax (602)970-6335) AIN is a partnership between large, medium, and small technologically innovative businesses and professional service companies that are working together to improve the economic and regulatory environment in Arizona. They provide educational programs, and create a support network for innovative businesses.

Arizona Library Association (AzLA)

(14449 N 73rd St. , Scottsdale AZ 85260-3133, (602)998-1954, fax (602)998-7838, e-mail - meetings@enet.net) AzLA represents all types of Arizona libraries and serves to promote and improve library service and librarianship in Arizona. They are active in promoting the expansion of library services to the public via electronic access and services.

Arizona Newspaper Association

(1101 N Central Ave., Suite 670, Phoenix AZ 85004-1947, (602)261-7655, fax (602)261-7525, URL - http://www.infop.com/ana/index.html) The Arizona Newspapers Association is a non-profit trade association representing daily (25), weekly (52) and (bi-)monthly (9) Arizona newspapers and publications. They offer an advertising promotion and placement service, a press release service and a press clipping bureau.

Arizona Online Users Group (AOLUG)

(c/o Mark Goldstein, International Research Center, PO Box 825, Tempe, AZ 85280-0825, voice & fax (602)470-0389, e-mail - markg@xroads.com) AOLUG supports online researchers and professional users of databases with periodic educational meetings and workshops.

Arizona Procurement Technical Assistance Network (APTAN)

(1435 N Hayden Rd., Scottsdale, AZ 85257-3773, (602)945-5452, fax (602)970-6355, AAVIS-II modem - (602)945-5452) APTAN offers the **Arizona Automated Vendor Inquiry System (AAVIS-II)**, a free, publicly accessible, electronic database of business profiles and thousands of Arizona companies to assist agencies, contractors and businesses in locating Arizona vendors of products and services. APTAN's **Bid Source** provides targeted information on pending federal and local government contracts to subscribers and researches technology transfer opportunities.

Arizona Science Center

(147 E Adams St., Phoenix, AZ 85004-2394, (602)258-7250, fax (602)256-0033, URL - http://aztec.asu.edu/government/Tempe/asc/asc.html) The Arizona Science Center is an interactive science facility based on the "learn-by-doing" approach. The Center contains hands-on exhibits, offers live science demonstrations, and hosts special events and activities. The Center's newest exhibit is "Computer Works." Construction of a new 120,000 square-foot facility is underway with a planetarium & large-screen theater.

Arizona Software Association (ASA)

(3900 E Camelback Rd., Suite 200, Phoenix, AZ 85018, (602)912-5351, fax (602)957-4828, URL - http://www.syspac.com/~mdixon/asa.html) The ASA is one of the Governor's Strategic Partnership for Economic Development (GSPED) industry clusters representing an active Arizona software development and marketing industry. They hold a wide range of seminars, conferences and dinner meetings.